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ABSTRACT

To determine whether maternal involvement reflects her expectations about her child's ability to solve the tasks at hand, a group of 32 boys and their mothers were studied. Sixteen of the boys were classed as reflective and 16 were classed impulsive on the Matching Familiar Figures Test. The boys were matched on age (8 years 9 months and 8 years 6 months), IQ (120.3 and 118.3), and social class (no differentiation on Hollingshead two-factor index). The mothers accompanied their children to the test room where they were advised that during the performance of four tasks by the children, the mothers could help as little or as much as they liked. Children were than presented with two easy and two difficult tasks to complete in counter-balanced order. Each of the tasks included a verbal and a non-verbal problem, to be completed in 10 minutes each. The mothers were asked to write the childrens' answers to the verbal tasks. While the interaction session was in progress, the observer sat behind the subjects and coded both maternal and child behaviors in 10-second blocks on predefined behavioral categories. The study data indicated that mothers of impulsive boys provided more direction and structuring than did mothers of reflective boys. Maternal interventions increased with task difficulty, indicating that the mother's behavior is a reflection of her expectations about her child's ability to cope with the tasks at hand. The two groups of children did not differ on interaction measures; however, the impulsive children tended to engage in more irrelevant conversations. (DB)

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Mother-Child Interaction in a Structured Situation: A Comparison of Reflective and Impulsive Boys[1]

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Several recent studies have focused on the relationship between patterns of parent-child interaction and particular cognitive characteristics of the child. For example, Bing (1963) studied mother-child interaction in a problem-solving situation and found that mothers of highly verbal children were more directive than mothers of children high in spatial ability. Bee (1967), using a similar procedure, found that parents of distractible children provided more direction and help than parents of non-distractible children. In our own work, we have been comparing selected groups of mother-child pairs in a structured problem-solving situation. We have found, for example, that mothers of children diagnosed as hyperactive provide more direct help, encouragement, and suggestions about impulse control than mothers of normal subjects (Campbell, 1973), while hyperactive children make more comments on the tasks and their own performance. Mothers of children with specific learning disabilities also provide more help and structuring when observed interacting with their children in a problem-solving situation (Campbell & Hopkins, 1973). In addition, we have selected normal groups scoring at the extremes on Kagan's measure of reflection-impulsivity, and compared them interacting with their mothers in the same structured situation. To our surprise, in the first study, mothers of reflective children became more involved in task solution than mothers of impulsive ones and an interview indicated that they had higher expectations for achievement.

Most investigators of socialization and cognitive development have viewed their findings in terms of the effects of the parents on the child, although in many cases data may just as easily be viewed in terms of the child's effects on the parents. Thus Bee (1967) interpreted her results in terms of independence training and argued that distractible children were granted less independence and were, therefore, less able to cope on their own, than their non-distractible peers.

Bing (1963) suggested that since mothers of children high in verbal ability interacted more, they provided less freedom for exploration of the physical environment, thereby impeding the development of spatial skills. However, one might argue that mothers of highly verbal children are responding to the child's tendency to seek out verbal interaction, while parents of distractible children provide more structure just because they are responding to this very quality of distractibility.

In our own work, an attempt has been made to deal with this issue of the direction of effect by providing both easy and difficult problems for children to solve and observing whether degree of maternal involvement varies with task difficulty. One question we asked was how much does mother's involvement reflect her expectations about her child's ability to solve the tasks at hand? Indeed, all our data so far indicate that mothers interact far less when their children are involved in solving tasks which are easy for them. It is when tasks are difficult that the mothers of hyperactive and learning disabled children begin to structure tasks and provide encouragement, suggesting that they are responding to their child's inability to do this efficiently on his own. Mother's of our first reflective sample, making high achievement demands, likewise intervened when tasks became more difficult.

The study I shall report on today was aimed at replicating our reflective-impulsive comparison in a larger sample, incorporating some changes in method, and including some additional coding categories.

Method

Subjects. Subjects were obtained from a local Montreal school. We are currently collecting data for a large developmental study, but I shall talk today about a sub-group of 32 boys, 16 of whom were classed as reflective and 16 of

whom were impulsive on the Matching Familiar Figures Test (Kagan, 1965). The Matching Familiar Figures Test is a matching-to-sample task which provides a reaction time and an error score for each subject. Children classed as reflective score above the group median in reaction time and below in number of errors. Impulsive children score below the median in reaction time and above in number of errors. Thus, reflectives are slow and accurate while impulsives are fast and inaccurate when required to select the one picture which matches the sample from among six alternatives. An example is shown in the first slide.

The group of 16 reflective and 16 impulsive boys were matched on age, IQ, and social class. The mean ages of the reflective and impulsive groups respectively were 8 years, 9 months and 8 years, 6 months ($t = 0.88$, $df = 30$) while the mean IQ's were 120.3 and 118.3 ($t = 0.52$, $df = 30$). Neither difference is statistically significant. Social class as measured by the Hollingshead two-factor index did not differentiate the groups ($\bar{X}$'s = 34.2 and 36.0, $t = 0.28$).

Procedure. Children and their mothers were ushered in to the test room and seated at a child-sized table. They were then presented with a series of tasks similar to those used by Bee (1967) and Campbell (1973). Instructions to the mother were as follows: "We have some things for _____ to do. Some will be hard for him and some will be easy. You can help him as much or as little as you like; it is entirely up to you." No further instructions were given to the mother.

Children were then presented with two easy and two difficult tasks to complete in counter-balanced order. Easy and difficult tasks each included a verbal and non-verbal problem. Ten minutes were permitted for completion of each task. The easy non-verbal task was a simple, but tedious pegboard design which the child had to copy. The easy verbal task required the child to name as many things as he could find on a series of five pictures of neighbor-

hood scenes. His mother was requested to write down the things named. The difficult non-verbal task required the child to reproduce the two most difficult block designs from the Wechsler-Bellevue scale. An anagrams task was used for the difficult verbal problem. The child was presented with five cardboard letters and required to make as many words as possible using those letters. Mothers were asked to write down the words.

Observations: While the interaction session was in progress the observer sat behind the subjects and coded both maternal and child behaviors in 10-second blocks on predefined behavioral categories. The coding categories were adapted from the work of Bee (1967) and Bing (1963) as well as our own work and are as follows:

Maternal Behavior Variables

Approval: Expression of approval, positive feedback about child's performance or ability. (89%)

Disapproval: Expression of disapproval about child's performance or ability said in a clearly hostile manner with no effort to communicate more than displeasure with the child. (92%)

Negative Feedback: Negative feedback about performance where the intent is to indicate to the child that he is on the wrong track, but where no hostility is intended. (70%)

Suggestion: Statement which provides information about task solution, coded accorded to level of specificity as:

a. specific - giving specific answer, telling child which block to move or where to place peg. (74%)

b. intermediate - less specific suggestion which focuses on a clearly defined area or mode of approach. (70%)

c. non-specific - general suggestions about solution which define task or suggest a new approach. (94%)

Encouragement: Attempts to improve child's performance through praise and urging. (78%)

Focusing: Focusing attention on an aspect of task, structuring task by having child sound out word, breaking task into elements. (80%)

Impulse Control Suggestion: Statement aimed at controlling child's behavior such as reminding him to focus attention, slow down, or persist. (84%)

Direct Physical Help: Actually moving a block, letter, or peg; pointing to an item on a picture. (95%)

Comment on Task: Comment on mother's assessment of task difficulty. (78%)

Conversation: Irrelevant conversation with child which is not necessary for task solution. (76%)

Child Behavior Variables:

Comment on Task: Impersonal comment on task difficulty or mode of approach. (80%)

Comment on Performance: Personal reference to one's own ability to solve the problem or on his progress. (89%)

Requests Feedback from Mother: Child asks for feedback about performance. (83%)

Requests Help: Child asks mother for help in task solution. (75%)

Rejects Help: Child refuses help offered by mother. (77%)

Conversation: Comments not related to task at hand. (77%)

The entire interaction session was recorded on a Sony TC-120 cassette tape recorder.

Inter-observer reliability was determined on ten subjects in which an additional trained observer coded the interaction. The percentage of agreement was

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calculated as the ratio of agreements to agreements plus disagreements. Reliability ranged from 70% to 95% with a median of 80%.

The Matching Familiar Figures Test, Wechsler Intelligence Scale and several other measures were administered after the interaction session, so the observational data were, in effect, collected blind.

Each coding category had a letter code; some examples are shown in slide 2. Child's and mother's behavior were coded simultaneously and in sequence on a coding sheet shown in slide 3. Slide 4 shows an actual minute of coding. Each vertical line denotes a ten-second block with the darker vertical line indicating the completion of one minute. Thus in the first 20 seconds of this segment, the mother made a non-specific suggestion followed by a focusing and then the child requested feedback from mother.

Results:

Since scores were quite variable, raw data for the interaction measures were converted to log (x + 1) and analysed using a 2 x 2 analysis of variance with repeated measures. This permitted the assessment of the effects of cognitive style and task difficulty on the interaction measures. Significance levels are reported at .05 and better given 1 and 30 degrees of freedom for all comparisons.

Almost all variables showed a task effect with interaction increasing significantly with task difficulty. Thus mothers made significantly more suggestions (F's 52.34, 26.17, 6.84), approving (F = 24.81), disapproving (F = 12.93), and encouraging statements (F = 25.16), and comments on the task (F = 28.46) during the difficult tasks. They also provided more direct physical help (F = 94.44) and negative feedback (F = 80.07). Impulse control suggestions, focusing, and conversation by mother did not vary with task difficulty.

Children made more comments on their own performance (F = 17.27) and the tasks (F = 31.89) and requested more feedback from mother (F = 11.19) during

the difficult tasks. They also rejected help more often (F = 6.99), but irrelevant conversation was unaffected by task difficulty. Thus, both mothers (F = 91.63) and children (F = 26.94) interacted more during the difficult tasks, as can be seen from slide 5 which graphically depicts the mean score for all variables combined on easy and difficult tasks.

Mothers of impulsive boys focused attention on one aspect of the task (F = 4.57) and made more suggestions about impulse control (F = 7.54) during both easy and difficult tasks. The data for focusing are shown in slide 6. They also made more disapproving statements during the difficult tasks (F = 5.36) and there was a tendency for mothers of impulsive boys to give more negative feedback (F = 2.72, $p < .10$), but this was only a trend. When all variables were combined, mothers of impulsive children interacted more than mothers of reflective children (F = 4.20). No child variables showed a group difference, although there was a trend for impulsive boys to engage in more irrelevant conversation (F = 3.08, $p < .10$). Mothers did not differ in the number of approving or encouraging comments, in the amount of direct help, or in the number of suggestions made. These data are summarized in Tables I and II.

Discussion

These data indicate that in this sample, mothers of impulsive boys provided more direction and structuring than mothers of reflective boys. Specifically, they made more suggestions about impulse control and tried to break the tasks down into manageable steps for the child. They also showed more disapproval of their child's attempts during difficult tasks and interacted more in general than mothers of reflective boys. Since maternal interventions increased with task difficulty, one interpretation of these data is that mother's behavior is a reflection of her expectations about her child's ability to cope with the

tasks at hand. Consistent with this view are the findings that mothers of clinic groups diagnosed as hyperactive and as learning disabled also provide more help and structuring than control mothers. Moreover, the types of maternal interventions appear to be directly related to the child's impulsive cognitive style. Mothers did not make more suggestions about task solution, but about impulse control. They provided structure by focusing attention, not by doing the task for the child. Thus their pattern of interaction suggests a response to the child's impulsivity. In this study mothers of impulsives were also more disapproving, something not observed in our comparisons of clinic and non-clinic groups.

The two groups of children did not differ on the interaction measures, although there was a tendency for impulsive children to engage in more irrelevant conversation than reflective children. Thus, the greater interaction from mothers of impulsives cannot be viewed as a response to the child's requests for help and feedback.

Comparison of these results with our original reflective-impulsive data (Campbell, 1973) reveals several inconsistencies. In the first study, mothers of reflective children provided more direct help than mothers of impulsive children and were generally more involved in task solution. The data of the present study are more in line with our predictions. One possible explanation for these inconsistencies may be found in data gathered in a structured interview administered to each mother after the interaction session. Mothers of impulsive boys in the first study had lower expectations for achievement than mothers of reflectives, while in the present study the groups did not differ. This suggests that maternal expectations interact with cognitive style. It appears that mothers with impulsive children and low expectations intervene less since their childrens' performance is consistent with their expectations, while mothers with higher expectations intervene as a means of pressing for better performance.

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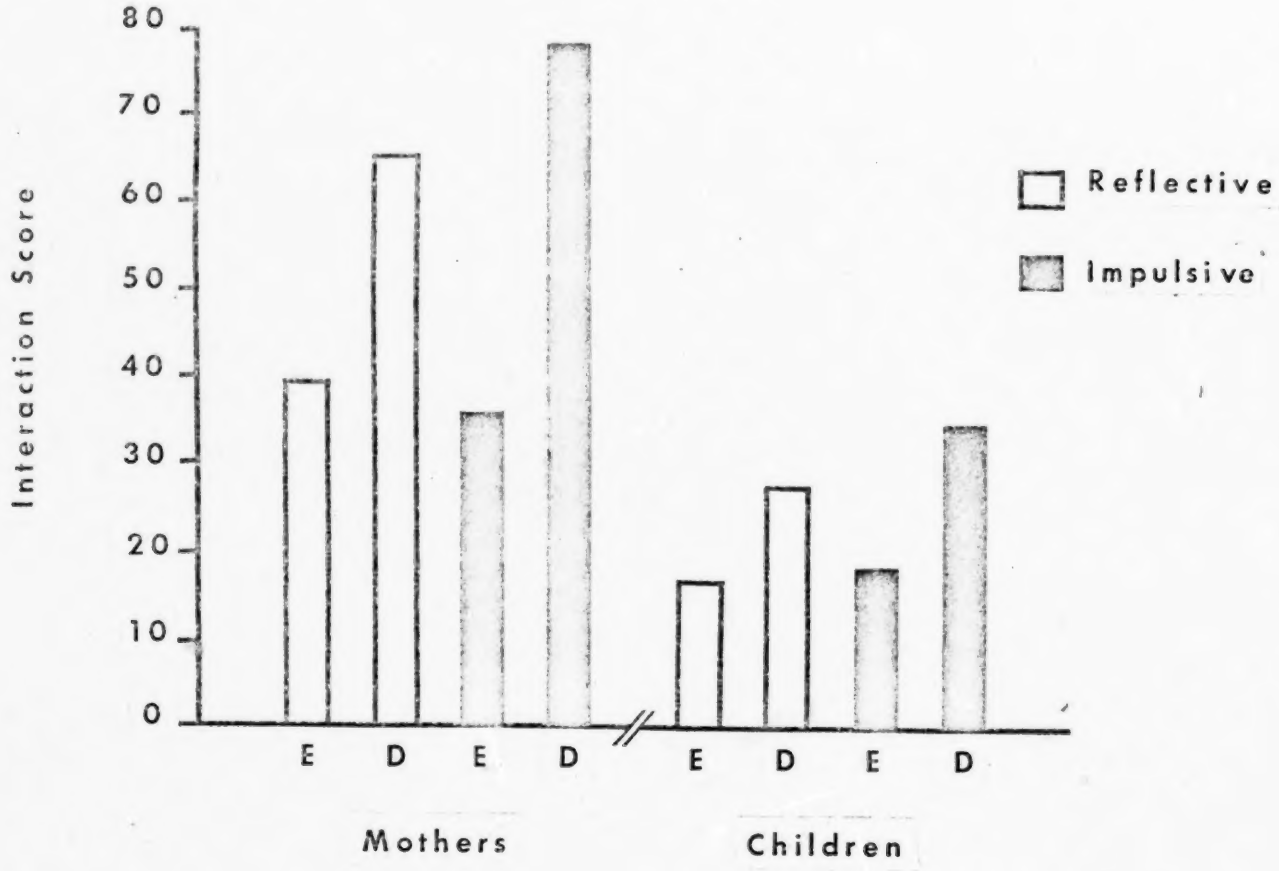
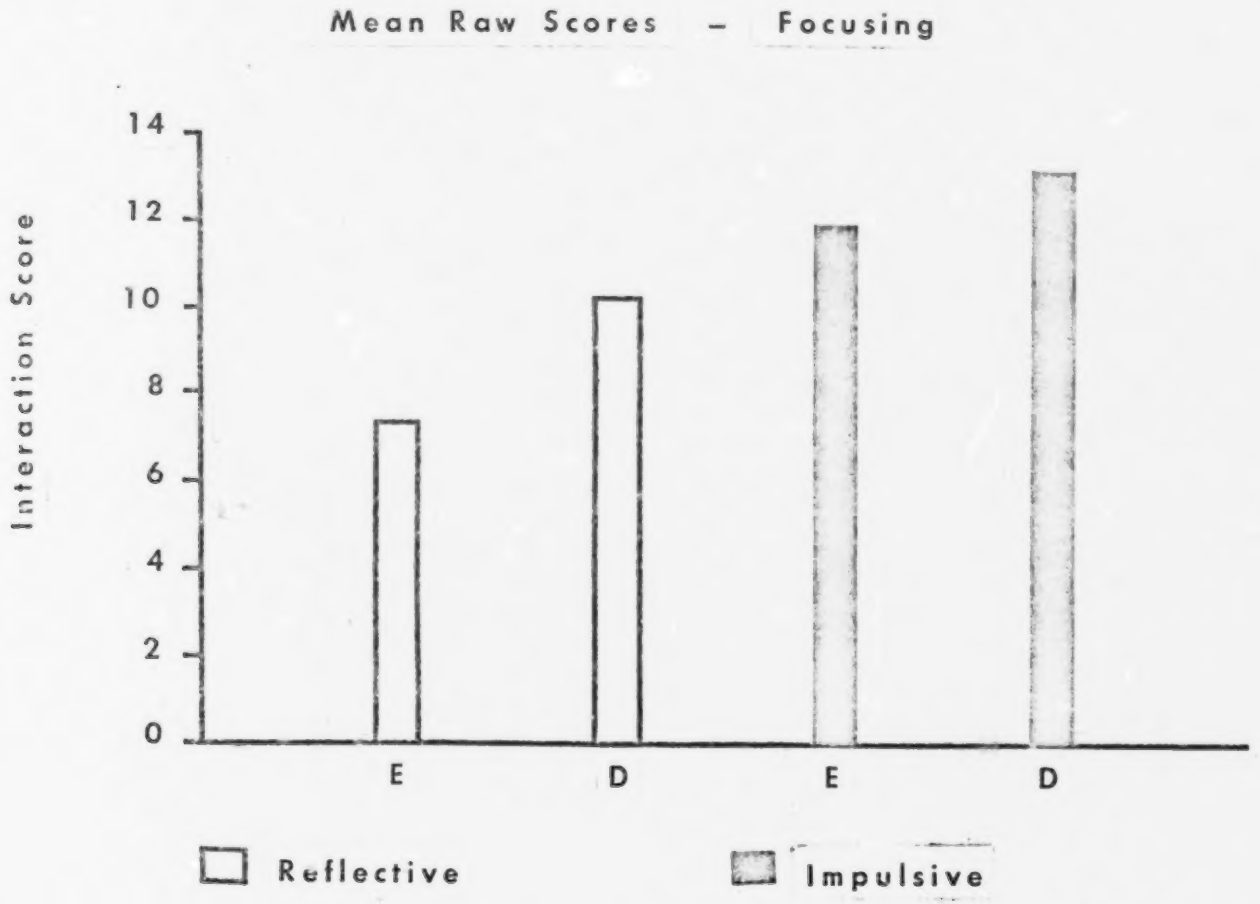
Mean Raw Scores for All Variables Combined
on Difficult and Easy Tasks



slide 5


Mean Raw Scores – Focusing
Interaction Score
14
12
10
8
6
4
2
0
E
D
E
D
Reflective
Impulsive

slide 6

Table 1

Means and Standard Deviations of Raw Data for Maternal Behavior Variables

Variable		Group				
			Reflective		Impulsive	
		Task	Easy	Difficult	Easy	Difficult
Direct Help	M		0.9	9.4	1.5	14.0
	SD		2.9	9.2	3.7	13.4
Focusing	M		7.4	10.2	11.9	13.2
	SD		6.1	5.2	8.6	8.6
Suggestions	M		3.6	14.8	4.3	14.5
	SD		3.5	9.7	3.4	6.2
Approval	M		3.2	9.9	4.9	9.2
	SD		3.3	8.3	5.3	8.6
Disapproval	M		0.3	0.8	0.2	2.0
	SD		0.5	1.5	0.5	2.7
Negative Feedback	M		2.0	7.3	3.3	10.3
	SD		3.3	6.5	3.2	7.7
Impulse Control	M		0.8	0.3	1.3	1.1
	SD		1.8	0.7	1.3	1.3
Encouragement	M		1.1	3.9	1.4	4.1
	SD		1.7	4.2	1.9	2.9
Conversation	M		4.5	4.8	5.9	5.4
	SD		3.9	3.7	5.3	4.3
Comment - Task	M		0.1	1.1	0.3	1.1
	SD		0.2	0.9	0.6	1.5

Table II

Means and Standard Deviations of Raw Data for Child Behavior Variables

Variable		Group				
			Reflective		Impulsive	
		Task	Easy	Difficult	Easy	Difficult
Comment - Task	M		5.4	10.3	5.1	12.6
	SD		5.6	8.3	4.5	7.7
Comment - Performance	M		5.3	7.9	5.9	12.6
	SD		3.7	5.9	6.5	7.8
Request Help	M		0.1	0.2	0.3	0.6
	SD		0.4	0.4	0.6	1.1
Reject Help	M		0.1	0.8	0.3	0.7
	SD		0.3	1.7	0.5	1.5
Request Feedback	M		5.7	7.6	3.3	6.6
	SD		7.9	6.1	3.5	5.4
Conversation	M		0.7	0.7	2.4	0.8
	SD		1.9	1.3	3.7	1.0